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(54) Title: FLUORESCENT SILICA-BASED NANOPARTICLES

(57) Abstract: The invention generally relates to fluorescent nanoparticles and more specifically to silica-based fluorescent nanoparticles of less than 30nm with covalently attached organic dyes. The invention provides a fluorescent monodisperse silica nanoparticle comprising fluorophore center core and a silica shell wherein the radiative properties of the nanoparticle are dependent upon the chemistry (composition) of the core and presence of the silica shell. In one aspect of the invention, the core-shell architecture provides an enhancement in fluorescence quantum efficiency. The invention generally provides control of photophysical properties of dye molecules encapsulated within silica particles with sizes down to 30 nm and below. This control is accomplished through changes in silica chemistry and particle architecture on the nanometer size scale and results in significant brightness enhancement compared to free dye.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/37963

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B32B 5/16; G01N 33/553; C09K 11/02; H01L 33/00
US CL : 428/403; 435/7.21; 252/301.4

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 428/403; 435/7.21; 252/301.4

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, P	US 6,548,264 B1 (TAN et al.) 15 April 2003 (15.04.2003), entire document.	1-13
Y	US 6,479,146 B1 (CARUSO et al.) 12 November 2002 (12.11.2002), entire document.	1-13
Y	US 6,251,303 B1 (BAWENDI et al.) 26 June 2001 (26.06.2001), entire document.	1-13
Y	WO 99/50916 A (MASSACHUSETTS INSTITUTE OF TECHNOLOGY) 7 October 1999 (07.10.1999), entire document.	1-13

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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